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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Docket Coordinator  
WIGGIN & DANA, LLP  
One Century Tower  
265 Church Street  
New Haven, CT 06508-1832

EXAMINER
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OH, TAYLOR V

ART UNIT	PAPER NUMBER
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1625

DATE MAILED: 08/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/996,480	<b>Applicant(s)</b> GRUZINS ET AL.	
	<b>Examiner</b> Taylor Victor Oh	<b>Art Unit</b> 1625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 April 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>7/30/02</u> . | 6) <input type="checkbox"/> Other: _____  |

Art Unit: 1625

The Status of Claims

Claims 1-31 are pending.

Claims 1-31 have been rejected.

**DETAILED ACTION**

Claims 1-31 are under consideration.

**Priority**

1. It is noted that the application is a CIP of 09/723,263 (U.S. 6,716,913) filed on 11/27/02.

**Drawings**

2. The drawings filed on 4/17/02 are accepted by the examiner.

***Claim Objections***

Claims 20, 25, and 27 are objected to because of the following informalities:

In claim 20, the phrase " the group consisting of \_ " is recited.

The period after the word " of " is improper. An appropriate correction is required.

Art Unit: 1625

In claims 25, and 27, the phrase " for use " is recited. The claims are directed to the prepolymer compound claims. That phrase may imply the method for the use. Therefore, the examiner recommends to remove that phrase in the claims. An appropriate correction is required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 6 recites the limitation "wherein said acid anhydride" in " the carboxy-containing monomer of claim 1 wherein said acid anhydride. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 recites the limitation "said organic or inorganic acid" in "the carboxy-containing monomer of claim 1" and "in the presence of 50-250 ppm of said organic or inorganic acid ". There is insufficient antecedent basis for this limitation in the claim.

Art Unit: 1625

Claims 14-17 , 25, 27, 29 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 14 , the phrases “ said low molecular weight polyol compound comprises” is recited. The expression is vague and indefinite because the term “comprising” would mean that there are other additional components besides the said low molecular weight polyol compound. The examiner may wonder what else is in the low molecular weight polyol compound. Therefore, an appropriate correction is required.

In claims 1, 25, 27, 29 and 31 , the terms “ an organic amine” ,“ a polyisocyanate” and “ an amine” are recited. The expression is vague and indefinite because there are numerous compounds for the polyisocyanates and the amines known in the art. The examiner may wonder which the polyisocyanate and the amine may apply for the prepolymer reaction product. Therefore, an appropriate correction is required.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1, 3, 5-19, 21-26, and 28-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-19 of U.S. Patent No. 6,716,913. Although the conflicting claims are not identical, they are not patentably distinct from each other because U.S. Patent No. 6,716,913 does disclose a carboxy-containing monomer as well as a

Art Unit: 1625

method of preparing a carboxy-containing monomer in the preparation of a polyurethane polymer in the following:

1. A carboxyl-containing monomer for use in preparing a polyurethane polymer, said carboxyl-containing monomer being the reaction product of a low molecular weight polyol compound selected from the group consisting of glycerol, trimethylolpropane, trimethylolethane, polyether polyols, and combinations thereof and an acid anhydride selected from the group consisting of maleic anhydride, phthalic anhydride, succinic anhydride, glutaric anhydride, and mixtures thereof, said reaction product being produced in the presence of 5-500 ppm phosphoric acid, said carboxyl-containing monomer having a viscosity in the range of about 3,000-100,000 centipoise, and having free oligomer content of less than 30 mg KOH/g.

2. The carboxy-containing monomer of claim 1, wherein said low molecular weight polyol compound is a polyether triol.

3. The carboxy-containing monomer of claim 1, wherein said carboxyl-containing monomer is made in the presence of 100-400 ppm phosphoric acid.

4. The carboxy-containing monomer of claim 3, wherein said carboxyl-containing monomer is made in the presence of 250-350 ppm phosphoric acid.

5. The carboxy-containing monomer of claim 1, wherein said viscosity of said carboxyl-containing monomer ranges from 3,000 to 50,000 cps.

6. The carboxy-containing monomer of claim 5, wherein said viscosity of said carboxyl-containing monomer ranges from 3,000 to 20,000 cps.

7. The carboxy-containing monomer of claim 1, wherein said free oligomer content of said carboxyl-containing monomer ranges from about 2 to 30 mg KOH/g.

8. The carboxy-containing monomer of claim 7, wherein said free oligomer content of said carboxyl-containing monomer ranges from about 2 to 20 mg KOH/g.

9. A method of preparing a carboxyl-containing monomer for use in preparation of a polyurethane polymer, comprising the step of combining a low molecular weight polyol compound selected from the group consisting of glycerol, trimethylolpropane, trimethylolethane, polyether polyols, and combinations thereof and an acid anhydride in the presence of 5-500 ppm phosphoric acid to produce said carboxyl-containing monomer, said carboxyl-containing monomer having a viscosity in the range of about 3,000 to about 100,000 cps and having a free oligomer content of less than about 30 mg KOH/g.

10. The method of claim 9, wherein said low molecular weight polyol compound is a polyether triol.

Art Unit: 1625

17. A prepolymer for use in preparing a polyurethane polymer, said prepolymer being the reaction product of (1) the carboxyl-containing monomer of claim 1, and (2) a polyisocyanate compound selected from the group consisting of diisocyanate, 4,4'-dicyclohexylmethane diisocyanate, isophorone diisocyanate, 1,4'-tetramethylene diisocyanate, 1,10-decamethylene diisocyanate, 1,12-dodecamethylene diisocyanate, toluene-2,4- or 2,6-diisocyanate, 1,5-naphthalene diisocyanates, 4-methoxy-1,3-phenylene diisocyanate, 4-chloro-1,3-phenylene diisocyanate, 2,4'-diisocyanatodiphenyl ether, 5,6-dimethyl-1,3-phenylene diisocyanate, 2,4'-diisocyanatodiphenyl ether, benzidine diisocyanate, 4,4'-diisocyanatodibenzyl, methylene-bis(4-phenylisocyanate), 1,3-phenylene diisocyanate, 4,4'-diphenylmethane diisocyanate, 2,4'-diphenylmethane diisocyanate, hexamethylene diisocyanate, 4,4'-dicyclohexylmethane diisocyanate, 1,12-dodecanediisocyanate, 2,4,4-trimethylhexamethylene diisocyanate, xylylene diisocyanate, tetramethyl-xylylene diisocyanate, polymethylene polyphenyl isocyanate, and combinations thereof, said prepolymer having a viscosity in the range of about 3,000 to about 100,000 cps.

18. A method of preparing a prepolymer for use in preparation of a polyurethane polymer, comprising the step of:

combining the prepolymer of claim 17 with a polyisocyanate compound selected from the group consisting of diisocyanate, 4,4'-dicyclohexylmethane diisocyanate, isophorone diisocyanate, 1,4'-tetramethylene

diisocyanate, 1,10-decamethylene diisocyanate, 1,12-dodecamethylene diisocyanate, toluene-2,4- or 2,6-diisocyanate, 1,5-naphthalene diisocyanates, 4-methoxy-1,3-phenylene diisocyanate, 4-chloro-1,3-phenylene diisocyanate, 2,4'-diisocyanatodiphenyl ether, 5,6-dimethyl-1,3-phenylene diisocyanate, 2,4'-diisocyanatodiphenyl ether, benzidine diisocyanate, 4,4'-diisocyanatodibenzyl, methylene-bis(4-phenylisocyanate), 1,3-phenylene diisocyanate, 4,4'-diphenylmethane diisocyanate, 2,4'-diphenylmethane diisocyanate, hexamethylene diisocyanate, 4,4'-dicyclohexylmethane diisocyanate, 1,12-dodecanediisocyanate, 2,4,4-trimethylhexamethylene diisocyanate, xylylene diisocyanate, tetramethyl-xylylene diisocyanate, polymethylene polyphenyl



Art Unit: 1625

isocyanate, and combinations thereof, to produce said prepolymer, said prepolymer having a viscosity in the range of about 3,000 to about 100,000 cps.

19. A water-borne polyurethane polymer, said water-borne polyurethane polymer being the reaction product of (1) the prepolymer of claim 17, and (2) an amine compound selected from the group consisting of: triethylamine, tripropylamine, ethylene diamine, n-butylamine, diethylamine, trimethylamine, monoethanol amine, dimethylethanolamine, aminoalcohols, hydrazine, hexamethylene diamine, isophorone diamine, cyclohexane diamine, dimethylcyclohexylamine, tris(3-aminopropyl) amine, 2-methylpentamethylenediamine, 1,12-dodecanediamine, and combinations thereof.

However, the instant invention differs from the prior art in that the claims are written as the composition claims, and the claims are divided into narrowed claims and broad claims, and the claims are rearranged.

Concerning the composition claims, the specification has indicated that it may be desirable to add other polyurethane prepolymers made from modified or unmodified polyether polyols or the like (see col. 7, lines 28-31) to the composition of the invention. Therefore, it would have been obvious to the skilled artisan in the art to be motivated to change the monomer claim into the composition claim in order to get a broad claim coverage.

Therefore, it would have been obvious to the skillful artisan in the art to be is motivated to change from the monomer claim to the composition claim as well as to rearrange the claims in such a way to emphasize the certain aspects of the claims in the method and in the composition claim because they are not patentably distinct from each other with respect to the claims of themselves.

***Claim Rejections - 35 USC § 103***

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Housel et al (U.S. 6,103,822).

Housel et al teaches a polymeric acid functional polyol which is a reaction product of one polymer, such as polyester polyols, polyether polyols, polyetherester polyols and a nonaromatic polyanhydride in the presence of catalysts (see col. 8, lines 1-2) in an amount of from 0 to 30,000 ppm (see col. 13, lines 22-24) for the purpose of controlling the reaction. The polymeric acid functional polyol has an acid value of from 10 to 150, a hydroxy value of from 20 to 500 and a hydroxy functionality of at least 2, and preferably from 2 to 4 (see col. 3, lines 46-54).

Furthermore, Aliphatic diacids used in the esterification reaction are oxalic acid, malonic acid, succinic acid, glutaric acid and their anhydrides; in addition, the polyols useful in the esterification reaction can be monomeric or polymeric (see col. 9, lines 60-67). Exemplary monomeric polyols include ethylene glycol, trimethylol propane and etc. (see col. 10, lines 5-8). Besides, for the manufacturing polyester polyols, the reactant carboxylic acids may render a residual acid value of less than 10 mg KOH/g with polyester polyols having acid values less than 1.5 (see col. 1, lines 35-40).

Moreover, water borne polyurethanes are formed as a urethane reaction product of a polymeric acid functional polyol and a polyisocyanate (see col. 11, lines 5-7), which may selected from any polyisocyanates useful for preparing polyurethanes (see col. 11, lines 31-32). Valuable polyisocyanates may include 2,2'-, 2,4'- and 4,4'-diphenylmethane diisocyanates. (see col. 11, lines 54-56).

In addition, water borne polyurethanes may contain primary or secondary polyamines as chain extenders, property modifiers, or crosslinkers and their examples are 1,2-ethylenediamine, hexamethylene diamine, isophorone diamine, 2,2-cyclohexylamine, and etc. (see col. 12 ,lines 50-59).

Also, in one of the examples (#9), an acid functional polyol product has a hydroxy functionality of at least 2 , and a viscosity of 12100 cps at 250<sup>0</sup> C. (see col. 19 ,lines 5-15).

The instant invention, however, differs from the prior art in that the claimed reaction product is formed in the presence of an organic acid or inorganic acid; the polyol composition has an oligomer content of less than 30 mg KOH/g.

Concerning the use of the organic acid or inorganic acid, the reference is silent. However, the reference does indicate that the reaction product of the polyol and the acid anhydride may be formed regardless of the addition of the catalyst. Therefore, the presence of the organic acid or

inorganic acid in the current invention does not give any patentable weight over the prior art reference in the absence of an unexpected result.

With respect to the oligomer content of less than 30 mg KOH/g, the reference does indirectly indicate the oligomer content in view of the passages of the prior art (see col. 4 ,lines 9-16), which describes that the reaction is terminated when the acid functional polyol has an acid value of from 10 to 150 during the process for making the polymeric acid functional polyol based on the esterified products. Therefore, it does teach that the prior art's polyol composition has an oligomer content of less than 30 mg KOH/g.

Housel et al does describe the polymeric acid functional polyol which is the reaction product of polyols and the acid anhydride in the presence of catalysts (see col. 8 ,lines 1-2) in an amount of from 0 to 30,000 ppm (see col. 13 ,lines 22-24) for the purpose of controlling the reaction. Also, Housel et al does the polymeric acid functional polyol may be used for the preparation of the polyurethane. Therefore, if the skillful artisan in the art had desired to control the reaction process for forming the polymeric acid functional polyol ,it would have been obvious to the skillful artisan in the art to be motivated to select the claimed organic acid from various catalysts by routine experimentations because the skilled artisan in the art would expect such a modification to be successful and

Art Unit: 1625

effective in controlling the reaction process as shown in Housel et al's process.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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*Taylor Victor Oh*  
8/26/04

*R. Desai*  
8/26/04